Practice: 634 - Waste Transfer

Scenario: #1 - Manure Auger

Scenario Description:

Scenario is for a manure auger associated with an agricultural production operation to transfer agricultural waste product from the storage facility to manure spreading equipment for proper utilization. This auger is used when the manure consistency will not allow for pumping. Payment includes the cost of the auger and labor for the electrical hook-up.

The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

In this typical setting, the operator has waste production from an animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

A typical installation would be for an auger to remove manure from an animal waste storage structure and facilitate the transfer of this material to the next step of waste treatment or utilization. This auger is for a tank less than 14' deep and is part of an animal waste management system to address water quality concerns.

Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 632, Waste Separation Facility; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling

Scenario Feature Measure: Auger, installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $5,577.71 **Scenario Cost/Unit:** $5,577.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$29.84	12	$358.08
Materials						
Manure Transfer, Auger or screw conveyor to transfer waste solids	1773	Auger or screw conveyor to transfer waste solids to a storage facility or manure spreading equipment. Includes shipping.	Each	$4,960.75	1	$4,960.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$258.88	1	$258.88

Practice: 634 - Waste Transfer

Scenario: #2 - Wastewater catch basin, less than 1000 gal.

Scenario Description:

Installation of a wastewater collection system that includes materials and structures to collect liquids of a design volume less than 1000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will be transferred from the collection basin to a waste storage facility. Payment includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area. Transfer pump if needed must be contracted under associated practice 533 Pumping Plant.

This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate waste management system able to collect wastewater from an operation that may contaminate surface or groundwater resources.

After Situation:

This practice scenario is suitable where the estimated design volume for wastewater transfer is less than 1000 gallons of contaminated liquid that may flow from silage bunkers or animal production facilities. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. With the installation of a precast manhole with lid or catch basin with grate.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

Scenario Feature Measure: Collection volume installed

Scenario Unit: Gallon

Scenario Typical Size: 1,000

Scenario Cost: $5,557.39 **Scenario Cost/Unit:** $5.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$16.62	2	$33.24
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$165.60	4	$662.40
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.04	4	$272.16
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$55.29	4	$221.16
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$360.59	2	$721.18
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.70	8	$453.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$26.97	12	$323.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	8	$162.56

Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.08	4	$88.32

Materials

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$17.46	5	$87.30
Catch Basin, concrete, 60" dia.	1754	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,098.83	1	$2,098.83

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$174.12	1	$174.12
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$258.88	1	$258.88

Practice: 634 - Waste Transfer

Scenario: #3 - Concrete Channel, with footers

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility.

Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

Scenario Feature Measure: Bottom surface area of concrete channel

Scenario Unit: Square Foot

Scenario Typical Size: 1,200

Scenario Cost: $9,657.69 **Scenario Cost/Unit:** $8.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$165.60	22	$3,643.20
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.04	8	$544.32
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$360.59	11	$3,966.49
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$16.62	4	$66.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	16	$325.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$26.97	8	$215.76
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$17.46	26	$453.96
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4' tall with openings that will not pass a 6" or larger sphere. Includes materials only.	Foot	$15.29	12	$183.48
Mobilization						

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$258.88	1	$258.88

Practice: 634 - Waste Transfer

Scenario: #4 - Concrete Channel, no footers

Scenario Description:

Installation of a concrete channel that consists of a slab with curb for the entire length of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility.

Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick for the entire length. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

Scenario Feature Measure: Bottom surface area of concrete channel

Scenario Unit: Square Foot

Scenario Typical Size: 1,200

Scenario Cost: $7,864.63 **Scenario Cost/Unit:** $6.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$165.60	19	$3,146.40
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.04	8	$544.32
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$360.59	9	$3,245.31
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$26.97	8	$215.76
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$17.46	26	$453.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$258.88	1	$258.88

Practice: 634 - Waste Transfer

Scenario: #5 - Lot Runoff Containment Wall

Scenario Description:

Installation of a concrete wall with footing to direct manure laden lot runoff to a collection basin and/or waste storage facility.

Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

Before Situation:

Current facility operations are allowing manure laden lot runoff to discharge from the feedlot and cause water resources to be contaminated.

After Situation:

Typical installation consists of a 2' high concrete wall with an adjacent 5' wide, 5" thick concrete slab. Typical length is 300'. The purpose is to direct lot runoff to a collection basin or waste storage facility. Wall also allows manure to be scraped to waste storage facility. Associated practices may include: 313 Waste Storage Facility; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management; 633, Waste Recycling; 561, Heavy Use Protection Area.

Scenario Feature Measure: Length of Wall installed

Scenario Unit: Foot

Scenario Typical Size: 300

Scenario Cost: $14,316.28 **Scenario Cost/Unit:** $47.72

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.04	4	$272.16
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$165.60	14	$2,318.40
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$360.59	30	$10,817.70
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$26.97	4	$107.88
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$17.46	31	$541.26
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$258.88	1	$258.88

Practice: 634 - Waste Transfer

Scenario: #6 - Concrete Channel with push-off wall at pond and safety gate

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel and push off wall to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion.

Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The push-off ramp is a concrete cantilever structure that allows the waste to be moved into the storage facility.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

Scenario Feature Measure: Bottom surface area of concrete channel

Scenario Unit: Square Foot

Scenario Typical Size: 1,200

Scenario Cost: $12,224.13 **Scenario Cost/Unit:** $10.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$16.62	5	$83.10
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$165.60	22	$3,643.20
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$360.59	17	$6,130.03
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.04	8	$544.32
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$26.97	8	$215.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	32	$650.24
Materials						
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4' tall with openings that will not pass a 6" or larger sphere. Includes materials only.	Foot	$15.29	16	$244.64
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$17.46	26	$453.96
Mobilization						

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$258.88	1	$258.88

Practice: 634 - Waste Transfer

Scenario: #7 - Concrete Channel with Drop Chute

Scenario Description:

Installation of a concrete channel that consists of a slab with wall and footing on each side of the slab for the entire length of the channel, in addition to an overfall structure at the channel outlet, to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility.

Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Solid/Liquid Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12'-wide x 12'-long push-off platform having an 8"-thick slab and 4'-high side walls. Push-off platform slab is supported on all four sides by a 6'-high wall with footer. A horizontal concrete beam is installed above the end of the platform to serve as a safety barrier for scraping equipment. Manure scraped off the end of the platform drops vertically onto a 16'-wide x 6"-thick concrete chute installed on the lower half of a 2:1 sideslopes of a manure holding pond. The purpose is to transfer manure and runoff from a feedlot area or livestock building to a waste storage facility.

Scenario Feature Measure: Channel with Drop Chute, installed

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $7,981.41 **Scenario Cost/Unit:** $7,981.41

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$165.60	13.7	$2,268.72
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$360.59	9.9	$3,569.84
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$56.70	8	$453.60
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$16.62	5	$83.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	32	$650.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$26.97	8	$215.76
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$25.33	19	$481.27
Mobilization						

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$258.88	1	$258.88

Practice: 634 - Waste Transfer

Scenario: #8 - Manure Flush System

Scenario Description:

Installation of a manure flush system consisting of a flushwater storage tank, flushing mechanism such as a valve, and flush water distribution. This practice scenario is suitable only where the water or wastewater supplies are available for operating a flush system to collect the animal waste deposited on the concrete surfaces. Payment includes tank, valve and distribution pipeline, site prep and concrete to support these structures.

This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

Before Situation:

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. A source of sufficient water or wastewater resources are available to design a flush system to clean the production floor and collect the waste materials deposited.

After Situation:

The design flush volume for the flush system is less than 1000 gallons. Concrete slab to support the tank and distribution pipeline is 28ft x 12 ft x 5" thick with 40 ft of above ground 8" pipe is used for distribution.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

Scenario Feature Measure: 1000 Gallons of flush water

Scenario Unit: Gallon

Scenario Typical Size: 1,000

Scenario Cost: $5,066.15 **Scenario Cost/Unit:** $5.07

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.70	8	$453.60
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	$16.62	4	$66.48
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$165.60	5	$828.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.08	8	$176.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	16	$325.12
Materials						
Pipe, PVC, 8", SCH 40	981	Materials: - 8" - PVC - SCH 40 - ASTM D1785	Foot	$9.65	40	$386.00
Tank, Poly enclosed Storage, 300-1000 gal	1074	Water storage tanks. Includes materials and shipping only.	Gallon	$0.89	1000	$890.00
Plug Valve, 8"	2101	8" diameter plug valve. Materials only.	Each	$1,681.43	1	$1,681.43
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$258.88	1	$258.88

Practice: 634 - Waste Transfer

Scenario: #9 - Wastewater Recycle System for Flush System, Pipes only

Scenario Description:

Installation of a wastewater recycle pipeline. A manure and wastewater flush system using recycled wastewater. Scenario is for the pipe system only to retrofit flush systems to utilize recycled water. Payment includes excavation, placement of bedding as needed, conveyance pipelines with valves and pipe backfill to transport water to the flush tank.

This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

Before Situation:

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. Wastewater however is available in a sufficient quantity to provide a flush cycle to clean the production floor and collect the waste materials deposited.

After Situation:

Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete production surfaces. The pipe design for the flush volume requires 300 feet of 3 inch diameter pipe for pressure flow.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling.

Scenario Feature Measure: Flush - pipes

Scenario Unit: Feet

Scenario Typical Size: 300

Scenario Cost: $2,769.04 **Scenario Cost/Unit:** $9.23

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.26	300	$378.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$56.70	12	$680.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	8	$162.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.08	12	$264.96
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$25.00	11	$275.00
Pipe, PVC, 3", SCH 40	977	Materials: - 3" - PVC - SCH 40 - ASTM D1785	Foot	$2.78	300	$834.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$174.12	1	$174.12

Practice: 634 - Waste Transfer

Scenario: #10 - 8 inch PVC pipeline, gravity or low pressure flow

Scenario Description:

Gravity or low pressure flow pipeline used to transfer manure or wastewater according to the CNMP. Payment includes the pipe plus clean-out risers and fittings, trench excavation and backfill, labor and equipment for installation. Typical installation applies to soils with no special bedding requirements.

This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

Before Situation:

There is a need to tranport manure or wastewater within a waste management system.

After Situation:

Install a 100 foot long 8 inch diameter PVC gasketted IPS pipe to transfer the manure wastewater. The transfer pipeline will deliver the manure slurry according to the CNMP, thereby protecting water quality resources.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling; 635, Vegetated Treatment Area.

Scenario Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 100

Scenario Cost: $1,486.79 **Scenario Cost/Unit:** $14.87

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.24	8	$41.92
Trenching, Earth, loam, 24" x 48"	54	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$2.86	100	$286.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	16	$325.12
Materials						
Pipe, PVC, 8", SDR 35	994	Materials: - 8" - PVC - SDR 35 - ASTM D3034	Foot	$6.67	125	$833.75

Practice: 634 - Waste Transfer

Scenario: #11 - Gravity or Low pressure 24 in Dual Wall pipeline.

Scenario Description:

Gravity or low pressure flow pipeline used to transfer manure or wastewater according to the CNMP. Payment includes the pipe plus clean-out risers and fittings, trench excavation and backfill, gravel bedding, labor and equipment for installation.

This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

Before Situation:

There is a need to tranport manure or wastewater within a waste management system.

After Situation:

Install a 100 foot long 24 inch diameter dual wall gasketted IPS pipe to transfer the manure wastewater. The transfer pipeline will deliver the manure slurry according to the CNMP, thereby protecting water quality resources.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; 633, Waste Recycling; 635, Vegetated Treatment Area.

Scenario Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 100

Scenario Cost: $6,176.09 **Scenario Cost/Unit:** $61.76

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$193.04	8	$1,544.32
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$22.08	8	$176.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	16	$325.12
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$25.33	72	$1,823.76
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	1246	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$18.45	125	$2,306.25

Practice: 634 - Waste Transfer

Scenario: #12 - PVC Pressure Distribution Pipeline.

Scenario Description:

Pressure flow pipeline used to transfer manure wastewater by pumping from the waste storage pond to the field where it is to be applied according to the CNMP. The pressure pipe moves the water by pumping from the intake riser location through a buried mainline with outlet risers. Payment includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves. Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.

This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

Before Situation:

There is a need to tranport manure or wastewater within a waste management system. The pressure distribution pipeline is utilized in the land application aspect of the operation.

After Situation:

Install a 2000 foot long 8 inch diameter PVC gasketted IPS pipe that has an SDR of 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

Associated practices may include: 313 Waste Storage Facility for storage structures; 533, Pumping Plant; 632, Waste Separation Facility; 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

Scenario Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 2,000

Scenario Cost: $31,650.93 **Scenario Cost/Unit:** $15.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$114.12	4	$456.48
Trenching, Earth, loam, 24" x 48"	54	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$2.86	2000	$5,720.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.24	180	$943.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$36.72	20	$734.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$20.32	80	$1,625.60
Materials						
Valve, sprinkler hydrant irrigation valve with riser, metal, 8" x 4" x 42"	2104	Irrigation hydrant valve assembly including saddle tee, coated metal riser and integral valve installed on a 8" dia. pipeline, 4" dia. X 42" long riser. Materials only.	Each	$309.16	7	$2,164.12
Plug Valve, 8"	2101	8" diameter plug valve. Materials only.	Each	$1,681.43	1	$1,681.43
Pipe, PVC, 8", SDR 26	991	Materials: - 8" - PVC - SDR 26 160 psi - ASTM D2241	Foot	$8.85	2000	$17,700.00
Valve, Air Vacuum Release, Continuous	1106	Materials for <2" Automatic Air/Vacuum Relief Valve (3 - Way Air Vac)	Each	$152.18	3	$456.54

Materials

Valve, Pressure Relief	1042	Materials for <2" Pressure Relief Valve	Each	$169.16	1	$169.16